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10/034,056	12/27/2001	Thomas Fuehrer	10191/2089	1828

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EXAMINER

JOO, JOSHUA

ART UNIT	PAPER NUMBER
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2154

DATE MAILED: 03/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/034,056

Applicant(s)

FUEHRER ET AL.

Examiner

Joshua Joo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/27/2001.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. Claims 1-34 are presented for examination.
2. Claims 1-34 are rejected.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted 12/27/2001 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-9, 13-19, 22-28, 32-33 are rejected under 35 U.S.C. 102(b) as being unpatentable by Turski, US Patent #5,402,394.
6. As per claims 1, 15, 17, 18, 19, Turski teaches an invention for synchronizing the times of computing nodes with an external reference time. The computing nodes, comprising of CPUs, are data or signal processing devices, which are connected in bus (Col 1, lines 5-18; Col 4, lines 15-16). Turski's invention comprises of:
 - a) Receiving a time signal of the external reference time at least one of the at least two stations (Col 8, lines 18-20. The reference computing node sends other computer nodes its stored reference time.),

b) Determining, in the at least one of the at least two stations, the correction target value between a received time signal and the common global time base (Col 5, lines 49-50; Col 8, lines 18-24. Computing node determines corrected time value in response to the received time signal and from its local time base.),

c) Sending the correction target value to other ones of the at least two stations of the distributed bus system (Col 8, lines 20-25. Computing node with the corrected time can send the corrected time value to other nodes of the bus system.), and

d) Determining the correction value in the at least two stations of the distributed bus system, as a function of the correction target value (Col 5, lines 49-50; Col 8, lines 18-24. Receiving computing node determines the corrected time in response to the received corrected time value and from its local time base.), and

e) Providing the common global time base that is synchronized with the external reference time at the predefinable instant for the at least two stations of the distributed bus system (Col 5, line 63-Col 6, line 2; Col 9, lines 30-34. Process of synchronization is repeated periodically. Time synchronization occurs as simultaneously as possible.).

7. As per claims 2 and 16, Turski teaches the invention, wherein a synchronization of the common global time base with the external reference time is triggerable by comparing the common global time base with the external reference time (Col 5, lines 49-50; Col 8, lines 17-24. Computing node compares its own clock time to the external reference time, and each computing node calculates its time with reference to the reference time.).

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8. As per claims 3 and 22, Turski teaches the invention, wherein the correction target value is sent to the other ones of the at least two stations periodically (Col 9, lines 30-34. Process of synchronization is repeated periodically.).

9. As per claims 4 and 23, Turski teaches the invention, wherein the correction target value is sent to the other ones of the at least two stations if the correction target value is other than zero (Col 8, lines 18-24. Computing node sends its corrected time to other nodes.).

10. As per claims 5 and 24, Turski teaches the invention, wherein the correction target value is sent to the other ones of the at least two stations upon a request by one of the other ones of the at least two stations (Col 6, lines 6-7. Computing node sends a request for synchronization.).

11. As per claims 6 and 25, Turski teaches the invention, wherein the correction target value is contained in a separate message sent to the other ones of the at least two stations of the distributed bus system (Col 8, lines 1-14. Synchronization object, which contains the correct time, is sent to other computing nodes.).

12. As per claims 7, 26, 27, Turski teaches the invention, wherein the correction target value is contained in a test data present in a data message of the distributed bus system that is sent to the other ones of the at least two stations (Col 5, lines 59-62. The synchronization message, e.g. initialization message, transmitted from a node may contain the counter value of the transmitting node.).

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13. As per claim 8, Turski teaches of the method of claim 1, wherein the correction target value is determined, in the at least two stations of the distributed bus system, using error correction as a function of the correction target value (Col 3, lines 40-50; Col 5, lines 51-53. Errors are taken into consideration in calculating the correction value in the bus system.).

14. As per claims 9 and 28, Turski teaches the invention, wherein the correction value is determined, in the at least two stations of the distributed bus system, using error correction as a function of the correction target value (Col 3, lines 40-50; Col 5, lines 51-53. Errors are taken into consideration in calculating the correction value in the bus system and continuous corrections are carried out during the next synchronization period.).

15. As per claims 13 and 32, Turski teaches the invention, wherein the predefinable instant for synchronizing the common global time base with the external reference time is explicitly predefined (Col 8, lines 4-14; Col 9, lines 19-34. Computing nodes are synchronized periodically, wherein it results in selecting a reference node and the simultaneous synchronization of all nodes.).

16. As per claims 14 and 33, Turski teaches the invention, wherein synchronization of the common global time base with the external reference time is trigger by transmitting the correction value to a synchronization algorithm at an explicitly predefined instant (Col 10, lines 11-43. Teaches equation for synchronization, using stored clock values and the reference time.).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 11-12, 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turski, US Patent #5,402,394.

19. As per claims 11 and 30, Turski teaches of synchronizing a node's local time by calculating its time with reference to the reference time or to the times of other computing nodes. The computing node can then sent its own time as the reference time to other nodes and synchronize other computing nodes (Col 8, lines 17-24).

20. Turski does not specifically teach the method, wherein the common global time base is synchronized with the external reference time by adding the correction value to the common global time base.

21. It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the correct time value by adding the correction value to the local time because the purpose of Turski's invention is to calculate and correctly synchronize the nodes of the bus system. Teaching the method of adding would improve Turski's invention by providing a specific example of how to apply Turski's invention and thus effectively synchronize the times.

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22. As per claims 12 and 31, Turski teaches of synchronizing a node's local time by calculating its time with reference to the reference time or to the times of the other nodes. Computing node then can sent its reference time to other nodes (Col 8, lines 17-24).

23. Turski does not specifically teach the method, wherein the common global time base is synchronized with the external reference time by multiplying the correction value by the common global time base.

24. It would have been obvious to one of ordinary skill in the art at the time the invention was made to multiply the correction value to the local time because the purpose of Turski's invention is to calculate and correctly synchronize the nodes of the bus system. Teaching the method of multiplying would improve Turski's invention by providing a specific example of how to apply Turski's invention and thus effectively synchronize the times.

25. Claims 10 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turski, US Patent #5,402,394 and in view of Walter et al, US Patent #4,980,857 (Walter hereinafter).

26. As per claims 10 and 29, Turski teaches of using error correction in calculating the correction value in the busy system (Col 3, lines 40-50; Col 5, lines 51-53).

27. Turski does not teach the invention, wherein the correction value is determined, in the at least two stations of the distributed bus system, using Byzantine error correction as a function of the correction target value.

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28. Walter teaches using Byzantine data to check for occurrences in time error during a synchronization process for a multiple node processing system (Col 49, lines 21-24; Col 49, lines 51-57).

29. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Turski to use Byzantine data for error correction because both inventions are similarly interested with correcting time errors for the proper time synchronization of the nodes. Turski invention deals with providing time accuracy to all nodes of the bus system, so it would have been desirable to take time errors into consideration. The method of using Byzantine data improves Turski's invention by providing an example of time correction, and using it would provide a method for an accurate synchronization, and thus it would have been obvious to use Byzantine data to determine the correct time.

30. Claims 20, 21 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turski, US Patent #5,402,394 and in view of Mincher et al, US Patent #5,408,506 (Mincher hereinafter).

31. As per claims 20, 21, 24, Turski teaches of computing nodes comprising of CPUs (Col 1, lines 5-18; Col 4, lines 15-16).

32. Turski does not specifically teach the invention, wherein the memory arrangement includes one of a read-only memory, a random-access memory, and a flash memory.

33. Mincher teaches of a distributed time synchronization system, where each node within the system comprises RAM and ROM for storing application programs (Col 6, lines 13-15; Col 6, lines 24-26).

34. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Turski and Mincher because both inventions deal with time synchronization of multiple nodes, where each node possesses a CPU and a local clock. Furthermore, the teachings of Mincher to have memory improves Turski's invention by allowing the CPU in the nodes to store information and process tasks (Col 6, lines 27-28; Col 6, lines 36-41).

Conclusion

35. A shortened statutory period for reply to this Office action is set to expire THREE MONTHS from the mailing date of this action.

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua Joo whose telephone number is 571 272-3966 and fax number is 571 273-3966. The examiner can normally be reached on Monday to Thursday 8 to 5:30.


37. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John A Follansbee can be reached on 571 272-3964.

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38. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 16, 2005

JJ


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